

Supplementary Table 1.

Risk scores evaluated in study.

1 a) Full Rockall score (FRS; ref 4)

1 b) Admission Rockall score (ARS) excludes parameters marked with *

	0	1	2	3
Age (yrs)	<60	60-79	≥80	-
Shock	No shock (SBP≥100mmHg and pulse <100bpm)	Pulse >100bpm	SBP <100mmHg	-
Co-morbidity	No major comorbidity	-	Cardiac failure, Ischaemic heart disease, Any major comorbidity	Renal failure, Liver failure, Metastatic cancer
Diagnosis *	Mallory Weiss tear, no lesion, no stigmata	All other diagnoses	Malignancy of upper GI tract	-
Major Stigmata *	None or dark spot only	-	Blood in upper GI tract, adherent clot, visible or spurting vessel	-

SBP: Systolic blood pressure

1 c) Glasgow Blatchford Score (GBS; ref 7)

Admission Criteria	Score
Haemoglobin (g/dl)	
Male	
12 - <13	1
10 - <12	3
<10	6
Female	
10 - <12	1
<10	6
Urea (mmol/L)	
6.5 - <8	2
8.0 - 10	3
10 - <25	4
≥ 25	6
Systolic Blood pressure (mmHg)	
100 - 109	1
90 -99	2
<90	3
Pulse (bpm)	
≥ 100 bpm	1
Melaena	1
Syncope	2
Cardiac failure	2
Liver failure	2

1 d) AIMS65 (ref 8)

Admission Criteria	<u>Score</u>
Albumin <30g/l	1
*INR >1.5	1
Mental State: +GCS <14	1
Systolic Blood Pressure <90mmHg	1
Age >65yrs	1

*International Normalised Ratio

+Glasgow Coma Scale

1 e) Progetto Nazionale Emorragia Digestive score (PNED; ref 5)

Score:	1	2	3	4
Risk factors:	*ASA 3, Time to admission <8hrs	Hb \leq 7g/dL, Age \geq 80yrs, Renal failure	Rebleeding, ASA 4, Neoplasia, Liver cirrhosis	Failure of endoscopic therapy

*ASA: American Society of Anesthesiologists score

Supplementary Table 2.

Criteria for rebleeding (ref. 26)

Any one of:

- Haematemesis (or bloody nasogastric aspirate) > 6 hours post endoscopy
- Melaena after normalisation of stool colour
- Haematochezia after normalisation of stool colour or after melaena
- Tachycardia (pulse ≥ 110 /minute) or hypotension (systolic blood pressure ≤ 90 mmHg) after ≥ 1 hour of haemodynamic stability (ie no tachycardia or hypotension) in the absence of an alternative explanation such as sepsis, cardiogenic shock or medications
- Hb drop of ≥ 2 g/dl after two consecutive stable Hb values (< 0.5 g/dl decrease ≥ 3 hours apart)
- Tachycardia or hypotension that does not resolve within 8 hours after index endoscopy despite appropriate resuscitation (in the absence of an alternative explanation) associated with persistent melaena or hematochezia
- Persistent dropping Hb of > 3 g/dl in 24 hours associated with persistent melaena or hematochezia

Supplementary Table 3

Registered data

Characteristics of patients <ul style="list-style-type: none">- Age- Sex
Comorbidity <ul style="list-style-type: none">- ASA-score- Ischaemic heart disease- Cardiac failure- Renal failure- Liver disease- Liver cirrhosis- Liver failure- Any malignancy- Disseminated malignancy- Any major comorbidity- Previous surgery for peptic ulcer
Medication use <ul style="list-style-type: none">- NSAIDs- Aspirin- ADP-receptor inhibitors- Anticoagulants
Symptoms <ul style="list-style-type: none">- Coffee ground vomiting- Haematemesis- Melaena- Haematochezia- Syncope- Altered mental status
Blood tests <ul style="list-style-type: none">- Haemoglobin- Urea- Creatinine- INR- Albumin
Circulatory status at hospital admission <ul style="list-style-type: none">- Systolic blood pressure- Pulse
Endoscopy <ul style="list-style-type: none">- Time from admission to performance of endoscopy- Findings at endoscopy- Performance of endoscopic therapy- Bleeding uncontrolled by endoscopic therapy- Performance of endoscopic therapy impossible
Other treatment <ul style="list-style-type: none">- Number of received blood transfusions- Performance of surgery or interventional radiological intervention
Rebleeding <ul style="list-style-type: none">- Development of rebleeding

- Treatment of rebleeding
Mortality
- Bleeding-related mortality
- Non-bleeding-related mortality
Other data (related to hospitalisation and follow-up)
- Time from development of symptoms to hospital admission
- Admission overnight/weekend
- Length of ICU admission
- Patient discharged without performance of endoscopy
- Endoscopy performed on an outpatient basis
- Time of follow-up

ADP-receptor inhibitors : Adenosine diphosphate receptor inhibitors

ASA: American Society of Anesthesiologists

ICU: Intensive care unit

INR: International normalised ratio

NSAIDs: Nonsteroidal anti-inflammatory drugs

Supplementary Table 4.

Characteristics, treatment and outcome of patients by centre

Site	Yale	Glasgow	Truro	Odense	Singapore	Dunedin	Overall
n	799	600	542	539	433	99	3012
Age (years, median, [95% CI])	63 [24 to 90]	55 [22 to 87]	69 [24 to 91]	72 [31 to 93]	66 [27 to 87]	71 [22 to 88]	65 [24 to 90]
Sex (male)	432 (54)	371 (62)	314 (58)	301 (56)	274 (63)	58 (59)	1750 (58)
Comorbidity							
- Ischemic heart disease	181 (23)	95 (16)	85 (16)	117 (22)	81 (19)	21 (21)	580 (19)
- Liver disease	151 (19)	77 (13)	60 (11)	25 (5)	62 (14)	6 (6)	453 (15)
- Renal failure	56 (7)		40 (7)				266 (9)
- Any malignancy	157 (20)		75 (14)				430 (14)
Systolic blood pressure (mmHg) median, [95% CI])	125 [92 to 170]	127 [92 to 163]	129 [90 to 173]	125 [86 to 169]	120 [83 to 164]	127 [90 to 171]	125 [90 to 170]
Pulse (median [95% CI])	87 [60 to 125]	92 [62 to 133]	90 [63 to 126]	90 [62 to 124]	91 [62 to 125]	86 [56 to 115]	89 [61 to 126]
Haemoglobin (median [95% CI])	107 [60 to 161]	128 [66 to 168]	124 [64 to 167]	102 [52 to 153]	101 [54 to 156]	97 [54 to 146]	112 [58 to 162]
Findings at endoscopy							
- Normal findings	47 (10)	45 (13)	62 (16)	91 (18)	38 (12)	14 (23)	297 (14)
- Erosive disease ^a	92 (20)	19 (6)	177 (45)	13 (3)	6 (2)	3 (5)	583 (28)
- Mallory-Weiss tear	14 (3)	37 (11)	8 (2)	33 (7)	18 (6)	7 (11)	63 (3)
- Gastric/duodenal ulcer	150	12 (4)	53	14 (3)	21 (6)	1 (2)	572
- Variceal bleeding							
- Upper GI-cancer							

Not endoscoped	(32)	269 (45)	(13)	41 (8)	109 (25)	36 (37)	(28)
	30 (6)		19 (5)				143 (7)
	16 (3)		6 (2)				70 (3)
	335		147				937
	(42)		(27)				(31)
Treatment							
- Number of transfusions (mean, [95% CI])	1.1 [0 to 5]	0.7 [0 to 4]	0.9 [0 to 4]	2.3 [0 to 8]	1.7 [0 to 6]	1.2 [0 to 6]	1.3 [0 to 6]
- Endoscopic treatment	128	89 (15)	85	166 (32)	5 (1)	18 (18)	574
- Surgery/embolisation	(16)	1 (0.2)	(16)	1 (0.2)		0 (0)	(19)
	22		8 (1.5)				37 (1.2)
	(2.8)						
Outcome							
- Actual low-risk patients ^b	440	420 (73)	331	216 (40)	178 (41)	51 (52)	1636
- Rebleeding	(55)	12 (2)	(61)	35 (7)	29 (7)	4 (4)	(55)
- Mortality	42 (5)	38 (6)	22 (4)	46 (9)	21 (5)	6 (6)	144 (5)
	48 (6)		48 (9)				207 (7)
Score (mean, [95% CI])							
- GBS	7.0 [0 to 14]	4.8 [0 to 13]	5.7 [0 to 14]	7.8 [0 to 14]	7.5 [1 to 14]	8.1 [0 to 14]	6.6 [0 to 14]
- AIMS65							
- Adm. Rockall score	1.0 [0 to 3]	0.9 [0 to 3]	0.9 [0 to 2]	1.2 [0 to 3]	0.9 [0 to 3]	1.2 [0 to 2]	1.0 [0 to 3]
- Full Rockall score							
- PNED	3.2 [0 to 5]	2.4 [0 to 5]	2.6 [0 to 5]	2.7 [0 to 5]	3.5 [1 to 7]	2.8 [0 to 5]	2.7 [0 to 5]
	4.5 [2 to 7]	3.8 [1 to 6]	3.6 [1 to 6]	3.8 [1 to 7]		3.8 [1 to 6]	3.9 [1 to 7]
	3.9 [0 to 10]	2.7 [0 to 7]	2.7 [0 to 7]	2.7 [0 to 7]		2.8 [0 to 8]	3.0 [0 to 8]

Data are number of patients (%), unless otherwise stated

^aoesophagitis, gastritis or duodenitis

^bNumber of patients without need of intervention (transfusion, endoscopic treatment, surgery, or embolization) who survive

CI: Confidence Interval

GI: Gastrointestinal

Supplementary Table 5.

Discriminative ability of evaluated scoring systems by centre

(figures shown for all patients in whom the score was calculated)

Site	Yale	Glasgow	Truro	Odense	Singapore	
Intervention or death (AUROC [95% CI])						
- GBS	0.89 [0.86 to 0.91]	0.86 [0.82 to 0.89]	0.86 [0.83 to 0.89]	0.91 [0.88 to 0.93]	0.89 [0.86 to 0.92]	0.9
- AIMS65	0.70 [0.66 to 0.74]	0.71 [0.67 to 0.76]	0.67 [0.63 to 0.72]	0.75 [0.71 to 0.79]	0.67 [0.61 to 0.72]	0.5
- ARS	0.71 [0.68 to 0.74]	0.66 [0.61 to 0.71]	0.72 [0.68 to 0.76]	0.72 [0.67 to 0.76]	0.68 [0.63 to 0.73]	0.5
- FRS	0.65 [0.60 to 0.70]	0.57 [0.50 to 0.64]	0.73 [0.68 to 0.78]	0.79 [0.75 to 0.83]	0.67 [0.61 to 0.74]	0.5
- PNED	0.72 [0.69 to 0.76]	0.74 [0.70 to 0.79]	0.75 [0.70 to 0.79]	0.74 [0.70 to 0.79]	0.70 [0.65 to 0.75]	0.5
Need for endo- therapy (AUROC [95% CI])						
- GBS	0.73 [0.69 to 0.77]	0.79 [0.74 to 0.84]	0.76 [0.71 to 0.81]	0.75 [0.70 to 0.79]	0.67 [0.61 to 0.73]	0.5
- AIMS65	0.62 [0.56 to 0.67]	0.67 [0.61 to 0.73]	0.60 [0.54 to 0.67]	0.64 [0.59 to 0.69]	0.53 [0.46 to 0.60]	0.5
- ARS	0.67 [0.62 to 0.72]	0.60 [0.54 to 0.67]	0.62 [0.56 to 0.68]	0.61 [0.56 to 0.66]	0.58 [0.52 to 0.64]	0.5
Mortality (AUROC [95% CI])						
- GBS	0.74 [0.67 to 0.81]	0.76 [0.69 to 0.84]	0.71 [0.65 to 0.77]	0.59 [0.51 to 0.67]	0.69 [0.60 to 0.79]	0.5
- AIMS65	0.79 [0.73 to 0.85]	0.85 [0.80 to 0.89]	0.73 [0.66 to 0.80]	0.75 [0.68 to 0.82]	0.86 [0.79 to 0.94]	0.5
- ARS	0.78 [0.73 to 0.84]	0.74 [0.67 to 0.81]	0.79 [0.73 to 0.85]	0.72 [0.65 to 0.78]	0.83 [0.77 to 0.89]	0.5
- FRS	0.73 [0.62 to 0.83]	0.66 [0.56 to 0.75]	0.76 [0.68 to 0.85]	0.72 [0.64 to 0.79]	0.84 [0.75 to 0.94]	0.5
- PNED	0.82 [0.77 to 0.87]	0.81 [0.73 to 0.89]	0.79 [0.73 to 0.85]	0.77 [0.72 to 0.83]	0.82 [0.73 to 0.91]	0.5

AUROC: area under the receiver operator characteristics curves; CI: Confidence Interval; * Difference in

discriminative performance between centres